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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,642	07/19/2005	Ho-Suk Kim	08015.0023	1718
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EXAMINER				
DAVIS, PATRICIA A				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/542,642

**Applicant(s)**

KIM ET AL.

**Examiner**

PATRICIA DAVIS

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI.08)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Interval Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

**DETAILED ACTION**

1. The Applicant's amendment filed December 15, 2009 was received. Claim 1 and 8 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on April 15, 2009.

***Claim Rejections - 35 USC § 103***

3. Claims 1, 3-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling et al. (U.S. Pat. No. 6,338,492) (hereinafter "Schilling").

Regarding claim 1, Schilling teaches a sealing structure for polymer electrolyte fuel cell having a membrane electrode assembly (4) comprising: a bipolar plate (2) with groove bottom (sealing groove 17) and blind holes (anchor grooves 16, 18) that is coupled to the periphery of the groove bottom (sealing groove 17) and surrounds the reaction site of the bipolar plate (2) (see figs.1 and 3B). As shown in Fig. 3B, Schilling teaches that the blind holes (anchor grooves 16, 18) extend towards the outer edge of the bipolar plate (2). Schilling further teaches that the sealing element (member 10) and that it is known in the art to use rubber as a sealing material and also teaches that the sealing element (member 10) is made of an elastomeric material (see col. 1, lines 24-26; col. 3, lines 56-58). Schilling teaches a plug (gasket 15) interposed between said bipolar plate (2) and a membrane electrode assembly (MEA 4; see figures 1 and 3B). Schilling teaches the bipolar plate has an injected seal that has plugs (gaskets 15) that

are formed as a plate (see col. 3, lines 19-21 and col. 4, lines 3-22; fig. 3A). Schilling further teaches that the sealing element (member 10) is formed during an injection process (see col. 4, lines 3-22). Claim 1 is considered product-by-process claim. The cited prior art teaches all of the positively recited structure of the claimed apparatus or product. The determination of patentability is based upon the apparatus structure itself. The patentability of a product or apparatus does not depend on its method of production or formation. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP § 2113).

Schilling does not specifically teach that the anchor width is greater than the sealing groove.

Consequently, as evidenced by Schilling, the width of the anchor is a recognized known result effective variable whose determination would accordingly have been within the ambit of a person of ordinary skill in the art without undue experimentation. "The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05). Schilling discloses that the sealing element (member 10) is inserted into the blind holes (anchor grooves 16, 18) by way of plugs (gasket 15). Schilling further discloses that this process is formed by an injection method and is extended over the entire extent of the groove bottom (sealing groove 17) to strengthen the anchorage to the bipolar plate (2)

(see col. 4, lines 3-22). It is known that the width of the anchor can be changed to be greater than the width of the sealing groove for the known result effect variable. Therefore, it would have been obvious to a person of ordinary skill in the art to make this modification to optimize the width of the anchor to get the proper sealing for the polymer electrolyte fuel cell.

Regarding claim 3, Schilling does not specifically teach that the said anchor groove has a width of 1.5 times the width of the sealing groove. However, it would be known by one with ordinary skill in the art to change the size or proportion of the embodiments to properly seal the structure (col. 4, lines 23-35). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (MPEP § 2144.04). It is the position of the examiner that the disclosure provides no evidence of the criticality with regard to the width of the anchor groove in comparison to the sealing groove.

Therefore, it would have been obvious to one with ordinary skill in the art to change the size or proportion to properly seal the structure of the polymer electrolyte fuel cell.

Regarding claim 4, Schilling does not specifically teach a sealing structure for a polymer electrolyte fuel cell, wherein said groove bottom (sealing groove 17) and an blind holes (anchor grooves 16, 18) are equal in depth (see fig. 3B).

Consequently, as evidenced by Schilling, the depth of the disclosed sealing groove and anchor is a recognized known result effective variable whose determination would accordingly have been within the ambit of a person of ordinary skill in the art without undue experimentation. The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05). Schilling discloses that the sealing element (member 10) is inserted into the blind holes (anchor grooves 16, 18) by way of plugs (gasket 15). Schilling further discloses that this process is formed by an injection method and is extended over the entire extent of the groove bottom (sealing groove 17) to strengthen the anchorage to the bipolar plate (2) (see col. 4, lines 3-22). It is known that the depth of the anchor can be changed to be equal to the depth of the sealing groove for the known result effect variable. It is the position of the examiner that the disclosure provides no evidence of the criticality with regard to the depth of the sealing groove and anchor groove being equal to one another.

Therefore, it would have been obvious to one with ordinary skill in the art to modify the sealing groove and anchor for a polymer electrolyte fuel cell to have the same depth.

Regarding claim 5, as shown in figure 3B, Schilling teaches a sealing structure for polymer electrolyte fuel cell (sealing system; fig. 3B), wherein said blind holes (anchor grooves 16, 18) is formed extending into the periphery of the groove bottom (sealing groove 17) along a direction perpendicular to the periphery of the groove bottom (sealing groove 17) (see col. 4, lines 3-22).

Regarding claim 6, Schilling teaches an opposed bipolar plate (3) that has a membrane electrode assembly (4) located between the other bipolar plate (2) (see fig. 1) (see col. 3, lines 39-60). It is inherent that the bipolar plate (3) would have the same characteristics as bipolar plate (2).

Regarding claim 9, Schilling also teaches a polymer electrolyte fuel cell comprising said sealing structure (col. 3, lines 39-60).

Regarding claim 10, Schilling teaches that the anchor groove (12) of the opposed bipolar plate (3) is symmetric to the anchor groove (9) of the bipolar plate (2) (see fig. 1).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling as applied to claim 1, 3-6 and 9 above, and further in view of Sasaki et al. (U.S. Pat. No. 6,337,120) (hereinafter "Sasaki").

Regarding claim 7, Schilling does not specifically teach that the type of rubber used for the sealing structure be made of silicon, fluorine, or olefin.

However, Sasaki teaches a rubber silicon material for the sealing structure for the polymer electrolyte fuel cell (see col. 4, line 48).

The Courts have held that the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

Therefore, it would be obvious to a person with ordinary skill in the art to recognize the use of a silicon rubber material for the sealing structure because of its low viscosity which makes it easy to inject into the mold (col.4, lines 51-52).

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling applied to claim 1, 3, 4-6 and 9 above, and further in view of Sakumato et al. (U.S. Pat. Pub. No. 2002/0106954 (hereinafter "Sakumato").

Regarding claim 8, Schilling teaches a graphite bipolar plate (col. 2, lines 23-24) and a plug (gasket 15) that forms a plate (see fig. 3A), but does not specifically teach the type of elastic material used for the gasket.

However, Sakumoto teaches a carbon gasket (or flange) (see par. 0005 and 0006).

The Courts have held that the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

Furthermore, the combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR Int'l v. Teleflex Inc.*, 127 Sup. Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007) (see MPEP § 2143).



Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of a carbon bipolar plate and gasket in the bipolar plate of Schilling, because Sakumoto teaches it can fabricate the sealing structure for the polymer electrolyte fuel cell.

### ***Response to Arguments***

9. Applicant's arguments filed on July 10, 2009 have been fully considered but they are not persuasive.

*Applicant's principal argument is:*

*(a) that Schilling does not teach that the anchor groove of Schilling extends towards the outer edge of the bipolar plate.*

In response to Applicant's arguments, please consider the following comments.

(a) As shown in Figure 3B, Schilling does teach blind holes (anchor grooves 16, 18) that are extended down into the outer edge of the bipolar plate (2). It is the position of the Examiner that the outer edge of the bipolar plate (2) can be the bottom of the bipolar plate (2) of Schilling. Therefore, Schilling still overcomes the amendment.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA DAVIS whose telephone number is (571)270-7868. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA DAVIS/  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
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